MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018/2019

TSI2241 SYSTEM INTEGRATION AND ARCHITECTURE

(All Sections / Groups)

6th March 2019
9:00 a.m. – 11:00 a.m.
(2 Hours)

INSTRUCTION TO STUDENTS

1. This paper consists of **5** pages with **FIVE (5)** questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided.

QUESTION 1

a) User Requirements are statements in natural language plus diagrams of services the system provides, together with its operational constraints. These can be categorised into Functional Requirements (FR) and Non-Functional Requirements (NFR).

i) Provide a brief definition of NFR.

(1 mark)

ii) For a smartphone, state one NFR category AND provide a sample NFR based on that category.

(3 marks)

b) Based on the below scenario, design the most appropriate UML diagram to represent the information given.

(6 marks)

For a student to do his / her Final Year Project (FYP), the student must first browse the FYP website for potential titles.

If the student finds a suitable title, the student can approach the lecturer who proposed that title for more information. If both parties can come to an agreement, then the student can register for the FYP title. Else the student has to go back to finding a suitable title.

If the student cannot find a suitable title, the student may propose a new title. The student has to write a proposal for the title, then approach a lecturer to agree to take the student. The student has to keep approaching lecturers until a lecturer agrees to take the student. Once the lecturer agrees, the lecturer must key in the new FYP title to the website. After the new FYP title has been approved then the student can officially register for the title.

But before a student can register for a FYP title, the student must first register the FYP subject and attend a 2-hour briefing.

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QUESTION 2

a) Instead of just purchasing a commercial software package or building an in-house system, companies can also purchase a basic package that vendors will customize to suit their business needs.

Provide **TWO (2)** disadvantages of using a customized software package.

(2 marks)

b) As the IT manager of the company, you need to evaluate both proposals and make an informed decision so that the company is investing in the best project for the company.

1st proposal

Discount rate 15%

	Year				
	0	1	2	3	Total
Costs	45,000	12,000	8,500	6,000	
Discount factor					
Discounted costs					
Benefits	-	80,000	65,000	40,000	
Discount factor					
Discounted benefits					
Discounted (benefits-costs)					
Cummulative (benefits-costs)					

2nd proposal

Discount rate 10%

	Year				
	0	1	2	3	Total
Costs	30,000	10,000	10,000	10,000	
Discount factor					
Discounted costs					
Benefits	-	30,000	30,000	30,000	
Discount factor					
Discounted benefits					
Discounted (benefits-costs)					
Cummulative (benefits-costs)					

i) Calculate the NPV, ROI and payback period (in months) for the 1st proposal.

(3 marks)

ii) Calculate the NPV, ROI and payback period (in months) for the 2nd proposal.

(3 marks)

iii) Justify which proposal the company should invest in.

(2 marks)

QUESTION 3

a) For enterprise integration, the styles that can be used are files transfer, shared database, remote procedure invocation and messaging.

Illustrate, with a figure, enterprise integration using file transfer.

(2 marks)

b) When doing project estimation, one of the decomposition techniques used to measure software size is an indirect approach using function points (FP).

Given, the total of 14 technical factors is 53, fill up the following table and calculate the final FP estimation.
(*Note: Round the estimated count at 2 precision points, and the FP count at 0 precision points.*)

(4 marks)

Information domain value	Optimistic	Most Likely	Pessimistic	Est Count	Weight	FP Count
Num of simple inputs	5	7	10			
Num of simple outputs	3	4	7			
Num of average inquiries	3	3	4			
Num of complex files	2	3	4			
Num of average ext interfaces	2	2	5			

	Level of complexity		
Component	Simple	Average	Complex
Num of inputs	3	4	6
Num of outputs	4	5	7
Num of inquiries	3	4	6
Num of files	7	10	15
Num of ext interfaces	5	7	10

c) Quality can be thought of as the degree to which a set of inherent characteristics fulfils requirements.

i) State a product then justify why the product is a quality product.

(2 marks)

ii) In the context of project quality management, explain the "performing quality assurance" process.

(2 marks)

QUESTION 4

a) Given the following case study, identify **FIVE (5)** characteristics of organization culture that is being exhibited and state which sentence in the case study justifies that.

(5 marks)

It's really the people that make Google the kind of company it is. We hire people who are smart and determined, and we favor ability over experience. Although Googlers share common goals and visions for the company, we hail from all walks of life and speak dozens of languages, reflecting the global audience that we serve. And when not at work, Googlers pursue interests ranging from cycling to beekeeping, from frisbee to foxtrot. We strive to maintain the open culture often associated with startups, in which everyone is a hands-on contributor and feels comfortable sharing ideas and opinions. In our weekly all-hands ("TGIF") meetings—not to mention over email or in the cafe—Googlers ask questions directly to Larry, Sergey and other execs about any number of company issues. Our offices and cafes are designed to encourage interactions between Googlers within and across teams, and to spark conversation about work as well as play.

b) Data flow diagram (DFD) is one of the graphical tools that can be used to show how to transform input data into useful information.

Describe **FIVE (5)** mistakes to avoid when drawing DFD.

(5 marks)

Continued...

QUESTION 5

a) In the context of system architecture, provide **TWO (2)** differences between Client/Server architecture and Mainframe architecture.

(4 marks)

b) There are **THREE (3)** methods of integration; vertical, horizontal and star integration.

i) Provide the definition for vertical, horizontal and star integration.

(3 marks)

ii) Based on the below scenario, identify and justify which method of integration is being used.

(3 marks)

A company like Disney is a massive film studio that produces many Marvel films each year. Lately Disney has been targeting the acquisition of FOX (another film studio) which holds some Marvel characters intellectual properties. This will allow Disney to produce even more movies with Marvel characters.

End of Paper